

FOOTSTEPS

No.20 SEPTEMBER 1994

OUR ENVIRONMENT 

Our inheritance: the environment

FROM THE EDITOR

MOST PEOPLE believe that the creation of our planet began many thousands of millions of years ago. It is almost impossible for us to make sense of this length of time. However, it is easier to understand if we compare the earth to a person 46 years old.

We know nothing about the first seven years of this person's life and very little about their middle years. However, we do know that the earth had reached the age of 42 when God's creative hands caused it to flower. The dinosaurs and great reptiles did not appear until one year ago, when the planet was 45. Mammals first developed 8 months ago. Mankind appeared in the middle of last week. Modern humans have been around for only four hours. During the last hour we discovered agriculture. The industrial revolution began just one minute ago.

During these sixty seconds of time, humans have made a rubbish tip of

paradise. We have caused the extinction of many hundreds of plant and animal species, caused huge destruction in our search for fuel – oil, coal, gas and wood – and now we stand like greedy children with the power to destroy life as we know it on this beautiful planet.

The environment is our inheritance. It is ours to care for and pass on to our children. God's creation is a wonderful balance of nature. When we interfere with this balance, it is often impossible to fully understand the effects. What is becoming clear, however, is that environmental damage throughout the world threatens to have serious effects on

God's creation and on all our lives. All around the world we see the results of environmental damage: forests cut down and burnt, industrial pollution, soil erosion, deserts steadily growing, climate changes, global warming – the list is endless. However, our use of God's resources **can** be in harmony with nature – we do not have to be destructive.

In this issue of *Footsteps* we cannot begin to cover in depth all of the different issues that come under the heading of the environment. However, we look at practical ways in which we can become more aware of environmental issues and develop sustainable ways of living. The environment belongs to all of us. Let's make sure our views are heard!

Isabel Carter

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FOOTSTEPS

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Footsteps is a quarterly paper, linking health and development workers worldwide. Tear Fund, publisher of *Footsteps*, hopes that it will provide the stimulus of new ideas and enthusiasm. It is a way of encouraging Christians of all nations as they work together towards creating wholeness in our communities.

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Photo: Mike Webb

A mangrove swamp – vital protection against monsoon flooding of coastal rice fields.



Sustainability

THE KEY ENVIRONMENTAL ISSUE

by Mike Carter

HUNDREDS OF BOOKS have been written about ‘sustainability’. Perhaps the simplest way of explaining what it means is to look at the word itself. Sustainability is about the ability to sustain. Can whatever it is we are doing, continue in the long term?

The most common definition of sustainable development comes from *Our Common Future* – the report written by the UN World Commission on Environment and Development: ‘Sustainable development seeks to meet the needs and hopes of the present, without compromising the ability to meet those of the future.’

It may be helpful to think of sustainability in this way...

Sustainability = Production + Continuing resource base

So, for example, sustainable fishing of a lake would involve catching fish (production) without harming the breeding fish stocks in the lake (the resource base). Sustainability involves producing what we need without damaging the resources for production. It means harvesting the fruits of creation in a way that doesn’t reduce creation’s fruitfulness.

Sustainability may refer to a farming system, the harvesting of timber and forest products, how we dispose of human waste, how we operate a healthcare programme or, indeed, how a household or nation’s economy is managed. In each case the question is the same – can we continue what we are doing, in the way we are now doing it, for ever?

A sustainable system is one that can absorb stresses and shocks and yet quickly recovers production when the stress or shock is removed. For example, if coastal rice fields are well protected by mangrove swamps, the shock of severe monsoon floods may cause little long term damage. The rice fields may be covered in sea water, a crop may be lost, but the next crop will yield as before. If, however, the mangrove

swamps were removed, the sea water might completely destroy the rice fields – the system would collapse.

Just because a system is sustainable in one area does not mean it will be sustainable in another. Each community, each area, each industry must look with great care at its own methods to decide whether they are sustainable.

Many human activities are not sustainable – during the process of production, the remaining resources are harmed, destroyed or used up. This may be due to ignorance or greed or because people don't care. This is why environmental education is so important. As Christians, that education needs to be Bible-based, centred on how scripture instructs us to use and care for creation.

Unsustainable systems may be allowed to continue for another reason. For example, we know that the earth holds a limited amount of many resources such as oil, aluminium and tin. If we use these resources, eventually none will be left. But many people argue that these are resources God gave us to use and that before they are all used up, science and technology will invent alternatives. However, this is not good stewardship.

Another problem area comes when working out the real costs of production. For example, is it sustainable for a country to allow soft drinks and beer to be sold in cans? Does the actual price of a drink can include the real costs of producing the aluminium, collecting, disposing of or recycling the used cans? Should society and the environment be left to pay for picking up the mess? Surely, the polluter (the producer company and the consumer of the drink) should pay! If the polluters are forced to pay all the real costs they may well change the method of production and consumption to make it more sustainable.

What are your important environmental issues?

In a recent workshop in Nigeria, participants identified the following as the most important problems in their area in order of priority.

Soil erosion – the loss of soil for agriculture by water, wind and human activities. The loss of the top layer of soil also reduces the soil's ability to soak up rainwater, causing streams, wells and even rivers to dry up.

Desertification Many of the deserts in the world today were once forested or under agriculture. The need to encourage tree planting and introduce agroforestry methods into farming is vital.

Population growth As the world population increases, the pressure on land and resources increases. Whatever progress a country makes in education or agricultural production will have little if any effect on development if the population growth rate continues to rise.

Pollution Industrial gases released from manufacturing may cause respiratory and eye problems, especially in urban areas. The rivers and sea are often used as a huge dumping ground, causing many problems.

Waste disposal All of us produce waste, whether it is simply household waste or waste from manufacturing and industry. The ways in which we dispose of waste are often not sustainable. Individuals, companies and nations alike are all good at putting waste out of sight and forgetting it. However, the effects of poor waste disposal have a habit of catching up with us. Disposing of waste properly needs money and effort. Companies must be forced to dispose of their waste safely and to prevent pollution. Public concern is the most effective pressure. However, the best way of reducing pollution from waste disposal is to reduce – by



Photo: Jim Loring

Failing to face up to proper waste disposal leaves major problems for future generations.

more efficient use of resources – the amount of waste we produce. Many rich nations especially, are beginning to learn this lesson.

Energy and fuel scarcity The world's fuel resources – of wood, coal, petrol and gas – are being used up at an alarming rate. In addition, the burning of fuels in factories, vehicles and homes has increased the amount of carbon dioxide in the atmosphere. This acts like a blanket around the earth, causing it to become warmer – the 'greenhouse effect'. Scientists are only beginning to discover the full implications of this. The earth's warming could cause the gradual melting of the polar ice caps, a rise in sea levels, changes in crop production, imbalances in insect pests and changes in climate and rainfall patterns.

Mike Carter works in the International Department at Bishop Burton College, Beverley, N Humberside, UK, with experience in Kenya, Papua New Guinea and Nigeria.

Discussion Starters

Try these questions in a group discussion. Think about your own community area. However, it may also be helpful to think about other areas that members of the group have visited. Perhaps their problems are worse than in your area, or maybe they have found some solutions to similar problems.

- What are the main environmental problems in your area? List them in order of priority for you.
- Are people in the community aware of these problems? Is there a need to raise awareness of particular issues? If so, how?
- What solutions are there for the most important problems on your list?

Allow different groups in the community, (men, women, young and old) to discuss these questions separately. How do their answers compare? Can you make a plan of action that pleases everybody?



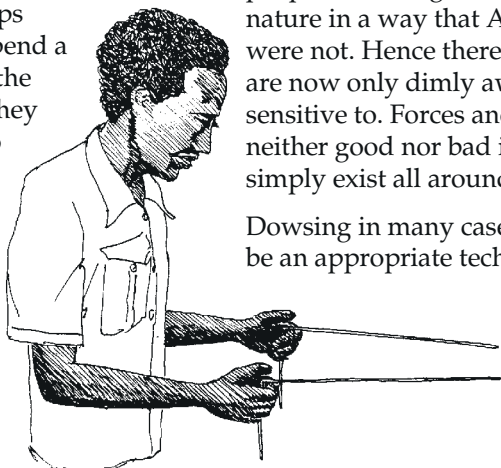
In search of water

DOWSING or *water divining*, can mean different things to different people. To the scientific community it is superstitious nonsense; to many farmers in Britain and elsewhere it is a useful method of finding good water for their livestock; to many it is something of a mystery. Finally, some Christians believe it to be dangerous and linked with satanic powers. However, due to its widespread use in many parts of the world it is a phenomenon worthy of investigation.

In the region of Scotland where I come from dowsing is part of our culture. I know two professional dowsers who are brought in to find water when a new well is required. Various methods are used for dowsing such as a Y-shaped hazel stick, two bent copper rods or metal coat hangers or a half-filled bottle of water. People can search for water, old mine shafts, electrical cables and gas mains.

Accepting that there is an effect to study, dowsing may be a powerful tool in the search for water. Many geologists with no interest in any spiritual matters will be content with the idea that dowsing is an effect created by underground rocks, giving details of the local ground-water to the student. Perhaps because geologists spend a great deal of time in the solitary rural areas, they are more prepared to believe an effect of which they have little understanding – a rare habit in the scientific community.

I have seen dowsing used in the UK and Southern Africa to



supplement geological investigations where the ground water conditions present a number of equally good sites for water. It is my experience that dowsing requires, not so much faith, as hard work and practice in order to determine the depth, quantity and quality of the water source. The effect appears to be useful but by no means conclusive in the search for water. It should certainly make no part of a formal training redundant. However, in a world where the search for water is increasingly important, should we throw away **any** useful indicator of the presence of water?

In Chicualacuala, Mozambique, there was an urgent need for improved water supplies due to a huge influx of refugees. People were walking 15 km to the nearest water hole. After thorough geological surveys, we used other methods to attempt to pinpoint the most likely areas for well drilling. Termite hills were mapped to see if any lines developed. A square pattern of dowsing was then carried out. The meeting of lines of termite hills, strong dowsing readings and hopeful geological patterns helped us identify the most likely locations for drilling. Over half the boreholes drilled were productive enough to be provided with a hand pump. Our drilling team consistently achieved a higher success rate (over 70%) than other teams operating in the same area.

From my own experience as a geologist and water engineer, I believe dowsing is one of the large number of things that we do not know about God's creation. God created both us and our environment in a most complex fashion. As fallen, sinful people, we are ignorant of much of nature in a way that Adam and Eve were not. Hence there is much that we are now only dimly aware of and sensitive to. Forces and effects that are neither good nor bad in themselves simply exist all around us.

Dowsing in many cases may prove to be an appropriate technology for rural

areas. However, a good deal of experience is required before the information can be treated as reliable. Before 'having a go' in any area unfamiliar to you, first take into account any cultural objections there may be to this practice.

*William Hume
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Water divining

THE WORD *divining* is unfortunate in that it carries connotations of spiritual darkness and the occult. Water divining I would see at worst as harmless, and at best as a gift to locate water. It is a gift that can be used for the well-being of the community in finding the basic need of water.

*Bishop David Leake
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EDITOR:

Do any readers have views and experiences about water dowsing which they would like to share in future issues of Footsteps?

Sharing experiences

We find *Paso a Paso* very useful, especially all the information related to ecologically sustainable agriculture. Our organisation SIMAS (Central American Service on Sustainable Agriculture) was formed when people realised that there was much knowledge, new experiences and understanding of ecologically sustainable agriculture, which was not being shared in this area. People in Nicaragua are not used to writing about their experiences, so this organisation began to help gather and share information and results obtained at all levels through the country.

We have at present about 50 Nicaraguan organisations and 40 Central American organisations which belong to the SIMAS network. We have a resource centre with over 2,500 books, magazines and videos about sustainable agriculture. We also publish a newsletter *El Güis* and a magazine *ENLACE* which is sent to members. We would welcome letters from other groups in Central America.

*Juan F Rodriguez
SIMAS, Apdo A-136, Managua, Nicaragua*

Community Action and the Environment

How communities can deal with politically sensitive environmental problems

by Andrew Leake

AROUND THE WORLD, more and more local communities are coping with environmental damage which is not caused by them. For example, a village that depends on a river for its drinking water and fish may find that the water becomes polluted by a factory further up the river. To solve the problem, the community may have to challenge the economic interests of the factory owner. This may lead to protests, campaigns, legal battles and – in extreme cases – violence.

A growing challenge for development workers is to know how to help communities in situations such as the one just described. Because of the economic and political interests at stake, intervention of this type is a delicate matter. It is not easy and it is open to all sorts of criticisms and misinterpretations. We must accept,

however, that God may call us to be involved in this way. It is important, therefore, to consider how we might act if the need should arise.

CASE STUDY

MOPAWI is a Christian development agency working with indigenous groups in the tropical rain forests of eastern Honduras (Central America). Since 1985 it has worked in agriculture, health, education, credit and women's projects.

Part of MOPAWI's work is amongst Tawahka Indian communities along the Patuca river. In 1987 agency staff realised that the forests surrounding this region were being cleared by lumber companies, cattle ranchers and farmers who were moving down the river, looking for new areas to exploit. They realised that if nothing were done, the Tawahkas would soon lose the natural resources that their sustainable subsistence economy has depended on for centuries.

Recognising the problem

Until now, the Tawahkas had not believed their forests were threatened. As one leader said, 'Since I was a child these forests have stood here unchanged. I could not imagine it being any other way.' So, a first step in helping the Tawahka to deal with the problem was to help them fully understand the situation.

To achieve this, MOPAWI took their leaders to visit indigenous groups in other parts of the country who had already seen their forests destroyed. By talking with them, they began to realise what it would mean if they also lost their forests. They would have nowhere to get materials to build their homes or construct canoes, nowhere to hunt for animals, nowhere to find medicinal plants and wild fruit. The soils would be eroded, rivers would silt up, fish would disappear and there would be no clean drinking water.

This process of awareness-raising continued, as the Tawahka leaders visited regions near their own communities where forests were actually being cleared. Here they met and talked with cattle ranchers and farmers and asked them why they were moving here and clearing the land. They learnt that many of them could not find land anywhere else, and that they had little choice but to cut the forest. Others were motivated by simple greed, with the aim of making a quick profit from cutting and selling the trees or breeding cattle.

'Since I was a child these forests have stood here unchanged. I could not imagine it being any other way.'



Photo: Mike Webb



Mapping is a key method of helping a community understand and explain environmental problems.

Raising the alarm

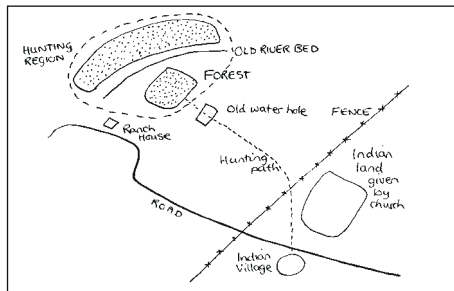
The whole experience was recorded on video and later shown to other community members. With this audio-visual material to back them up, the leaders were able to convince the rest of their community about the need to do something to protect their forest from outsiders.

Once the Tawahka people had decided they had a real need to protect their forests, MOPAWI helped them meet with the government. This allowed them to find out for themselves what their legal position was, concerning their rights to the forests. It also began good communication with the authorities. This was important, for it meant the government understood what it was they were doing. It also reduced any possible future misunderstanding of what could otherwise be seen as a political uprising of some sort.

Making maps

The Indians, with technical guidance from MOPAWI, then proceeded to document their situation. They provided information to a professional geographer about where and how they used the forests. He, in turn, put this information on maps. Another map made by the geographer showed the location and amount of deforestation, how little of the rain forest was now left, and therefore how important it was to protect it.

This information helped the Indians to further understand their own situation and added an ecological argument to their case. Using this information, they were able to explain their problem clearly and simply to the government and others. The maps helped to make the situation clear. They also made it difficult for those who were interested



in getting hold of the Indians' forests for political or economic interests, to use misleading information. The maps were, in fact, later used by the government as the basis for drawing plans for a proposed reserve which, if legalised, will protect the Tawahkas' forests.

A further benefit from the maps and video was that the press could use the material. This allowed the Tawahka to publicise their situation. By doing this they generated public interest and support which, in turn, provided further encouragement for the government to look into their claims.

Throughout this whole process, MOPAWI's involvement with the Tawahka often faced difficult challenges. Sometimes the Indians faced deep divisions within their community as a result of misunderstandings. Financial mismanagement of project funds at times made people lose their trust in their leaders. Outsiders sometimes accused MOPAWI of having its own economic interests, or of being politically motivated. These problems were overcome through prayer and patience. The important point was that the Tawahkas succeeded in getting their case before the government, avoiding any major direct confrontation with the cattle ranchers, farmers and lumber merchants.



Photo: Mike Webb

Without protection of their land, the Tawahkas would lose the natural resources that their subsistence economy has depended on for centuries.

Points to consider

MOPAWI's experience may be helpful in raising some important considerations for other organisations working to help people solve politically sensitive environmental problems – even though their situations may be different...

- Community concerns and action may clash with the economic and political interests of those responsible for causing the problem. The possible consequences of this should be carefully considered before any particular action is taken.

- The community should recognise the problem as their own (not the development worker's) and be fully responsible for any decision to take action to solve it.

- To help a community make a decision, the development worker or agency should help them gather all possible information on the problem they face. They must allow them to choose whether or not to take action, and to decide how this might best be done.

- If a development agency has decided to support a community in taking action, an overall strategy of involvement should be planned (see below), making sure that whatever is proposed lies within the organisation's legal mandate.

- Clear guidelines should be set for the development workers responsible for this task, indicating the extent and limits to which they should become involved with the community in their search for a solution.

- Because of the 'political' nature of this type of involvement, the development agency and its staff need to develop a deep level of trust by the

community and maintain clear and continuous communication with them.

- The development agency should provide a supporting role rather than leading any action the community takes. This support should help to identify and provide channels through which the community can take action for itself.

- Give emphasis to writing and publishing the facts about the problem. This helps to avoid the issue becoming confused with other political interests. Mapping the problem is often a good way in which this can be achieved. It also helps the community to come together and develop their understanding of their situation and explain it objectively to others (see *Footsteps 17*).

Phases of involvement

It may be helpful to identify the different phases in MOPAWI's approach to working with the Tawahka Indians, as these may serve as guidelines for other groups...

Awareness-raising Community becomes aware of the problem they face, and are helped to identify its causes and implications.

Decision to act Having considered the problem and the challenges to be faced in seeking a solution, the community must take the responsibility to decide whether or not to act. It is they who will have to live with the consequences of the action taken.

Work with the facts Gather information and publish the facts of the problem. This reduces the opposition's ability to influence public opinion with incorrect facts and opinions.

Support for the cause Winning public support is particularly important if the community is small and has little political influence. It will increase the chance of the community's claims being attended to.

Andrew Leake worked with MOPAWI for four years. He is now studying for a PhD at the University of Hertfordshire on the subject of land use patterns among indigenous groups in Paraguay. His address is: 45 Walton St, St Albans, AL1 4DQ, UK.



Photo: Mike Webb

The community must make the decisions about whether to take action. It is they who have to live with the consequences.

Community action to protect the environment

by Beatrice Akoth

There are several steps which communities can take to protect their environment:

1. Understand and identify the causes of all the changes which are taking place in the local environment – especially the more damaging ones.
2. Design appropriate land use systems which will reduce or prevent further damage – for example: soil and water conservation measures, tree planting etc.
3. Hold community meetings to encourage full support of the whole community in these measures. It may be necessary to set up local environmental protection regulations to ensure that people protect the entire environment.
4. Encourage people to plan for the future. Do local farming systems ensure wise use of resources on a sustainable basis for the benefit of present and future generations?

In order to achieve these steps, all community members should be educated to consider the whole environment. People must realise each one of us has a vital contribution to make in this issue. Environmental protection activities need to start right in our homes and then extend to our communities. Together we may be able to avoid the disastrous consequences of environmental misuse such as drought, desertification, famine, disease and eventual death.

Beatrice Akoth is an environmentalist by profession. She trained in Makerere University, Kampala. Her address is: PO Box 7009, Kampala, Uganda.

PILES OF SCRAPS of plastic, old batteries, paper wrappers and empty drink cans...

Rubbish is a problem all around the world. Large cities and developed countries have rubbish collection schemes. In the rural areas of most countries this is usually lacking. Wherever people go, they tend to leave rubbish behind – even on the moon!

Years ago rubbish was much less of a problem. Food and goods were wrapped in natural materials – banana and other leaves, occasionally newspaper. Gourds and clay pots were used instead of bottles. These materials would quickly decay and be absorbed into the soil. Today much of what is available to us comes wrapped in plastic, in tin cans or plastic bottles. These materials are strong, light and cheap to manufacture. But they take a long time to break down – in some cases a very long time indeed.

Much of our rubbish can be recycled and reused. Many people earn a living from recycling the rubbish tips in large cities. But there is always material left which has no further use. How long does our rubbish take to decay and disappear? Some of the answers will horrify you. This information may help people to consider carefully the problem of rubbish.

- How much of what we buy has unnecessary wrapping?
- How can we help to recycle and reuse material?
- How can we dispose of rubbish safely?
- Should we refuse to buy products in certain packaging? Some countries make the manufacturers responsible for disposing of the packaging.

Together we can try to make our surroundings more pleasant places.

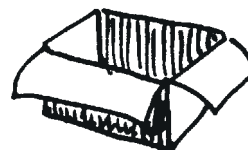
What happens to the rubbish?

by Isabella



Newspaper

Usually takes just a few weeks to decay.



Cardboard boxes

These can take several months to decay.



Leather shoes

The soles can take up to 50 years to decay.



Aluminium drink cans

These can take up to 80 years to decay. Try using them and other tin cans as pots for tree seedlings.

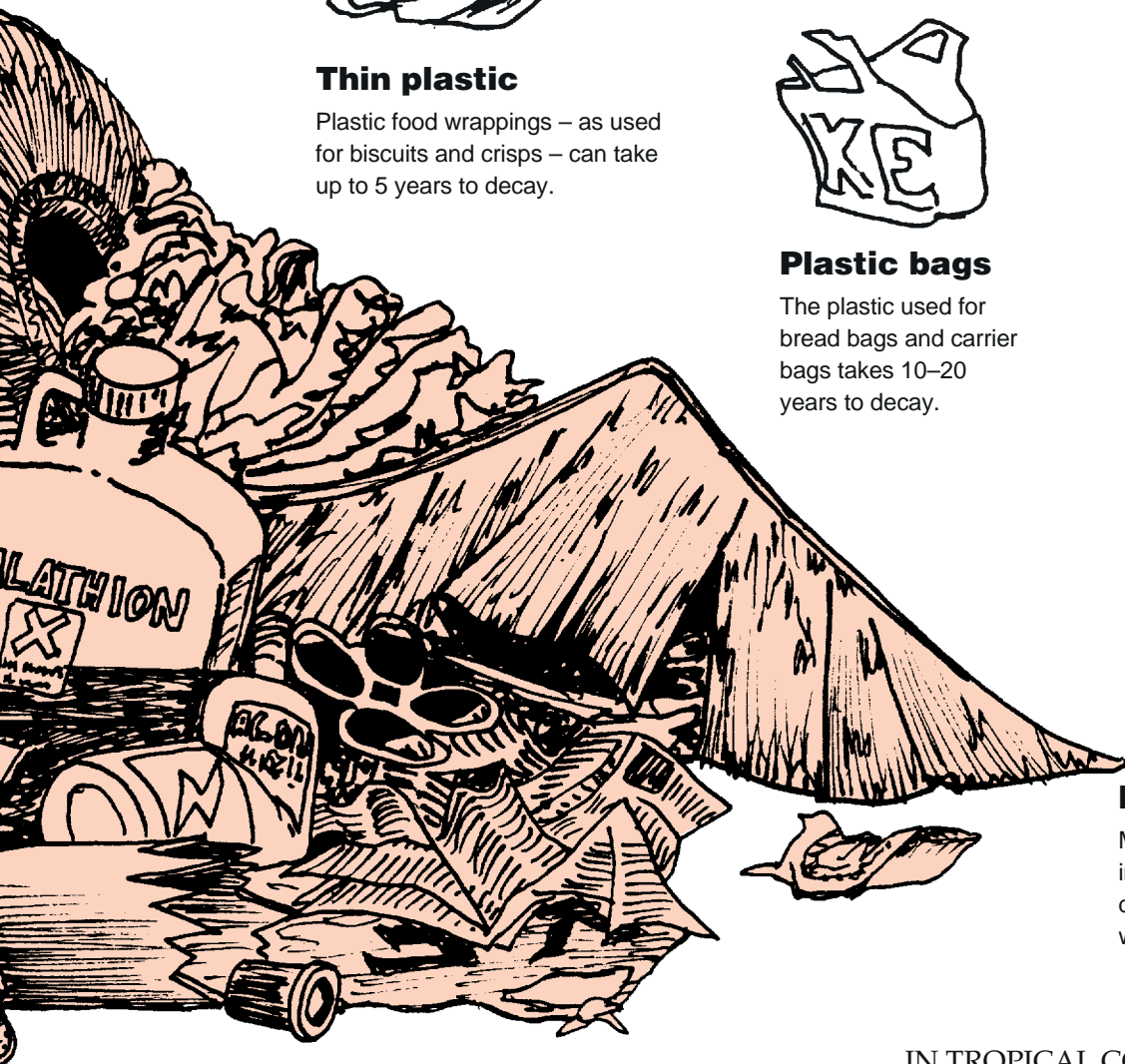


Glass bottles

Usually reused or recycled. However, once broken, they take up to one million years to decay – they erode like rock.

What happens to rubbish?

by Mel Carter



Banana leaves

These and other leaves used for wrapping and serving food usually take just a few weeks to decay. Make compost from all waste vegetable material.



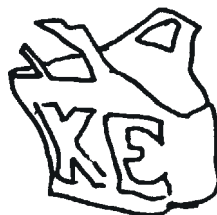
Tyres

Many uses, so are rarely seen as rubbish – however they take so long to break down that no figure is yet available.



Thin plastic

Plastic food wrappings – as used for biscuits and crisps – can take up to 5 years to decay.



Plastic bags

The plastic used for bread bags and carrier bags takes 10–20 years to decay.



Scrap metals

May take up to 50 years to decay, depending on the metal.



Plastic rings

The sort which hold beer and other drink cans together can take up to 100 years to decay.



Plastic bottles

Most kinds of plastic bottles will last indefinitely. Fortunately, scientists are developing new kinds of plastic which will eventually break down in sunlight.



Pesticide containers

These need special mention because they are so dangerous. They should never be left lying about, cleaned in rivers for reuse, or burned. Always dispose of them in special rubbish pits. Old batteries also contain dangerous chemicals. Dispose of them in the same way.

IN TROPICAL CONDITIONS there may be great variation in the length of time materials take to decay. If rubbish is wet and exposed to strong sunlight it will decay more quickly. The presence of termites will also significantly speed up the decay of vegetable, paper and cardboard rubbish.

With special thanks to the Marine Conservation Society, Ross on Wye; and Ynyslas Information Centre, Countryside Council for Wales, Aberystwyth, for their help in providing this information.

Case Studies

All around the world, groups are responding to environmental problems in a variety of ways. Here are a few examples...

Bainings Community Eco-forestry Project

THE EXTENSIVE FOREST of Papua New Guinea provides many of the everyday needs of the people. It also supports some of the richest and most varied wildlife in the world. In the last 30 years, an important timber trade has developed. Nearly all the harvested timber is exported without processing. The huge forest resources are being logged at an alarming rate, particularly by Malaysian and Japanese loggers. Papua New Guinea is unusual in that most of the land is owned by the people as clans and tribes. These landowners receive some compensation for the timber removed, but the payments are small and the damage done is great and permanent.

The Bainings people live in the hill areas of north central New Britain. The Community Eco-forestry Project has set up an ecological trading company to encourage sustainable harvesting of the forest. The Project aims to...

- increase awareness among local people of the wealth and diversity of the forest
- improve the welfare of local people through environmentally sound methods of managing natural resources.

Some of the activities that local people are doing include...

- surveying and mapping the vegetation and wildlife (see page 6)
- setting up small village-based saw mills to selectively harvest forest trees for timber
- marketing galip nuts and palm products
- rehabilitating old subsistence garden plots with tree planting
- butterfly farming for sale to collectors.

Max Henderson

Community Action Groups, Western Uganda

UGANDA, like many less developed countries, faces many environmental problems. Most of the population is concerned about these problems and will put effort into helping solve them, when possible.

I carried out a study in the western part of the country where I found communities had organised themselves in groups – mostly dominated by women and young people who are taking positive measures to prevent continued damage to their local environment. They are involved, for example, in...

- Establishing tree nurseries to provide seedlings for woodlots and tree plantations to reduce the shortage of wood for fuel and other wood products.
- Proper cultivation methods – contour ploughing when the area is

The Samitis of West Bengal, India

WOMEN EVERYWHERE are local experts in cultivating subsistence and certain cash crops, identifying erosion problems and understanding the uses of forests and trees. They know whether the wood of each species is best for boiling water (a fast, hot fire), cooking beans (a slow, cool fire), firing bricks (a long, hot fire), curing tobacco or brewing beer. They know the medicinal properties of trees and whether they are resistant to termites.

In West Bengal, settlers and logging companies cleared forest areas, causing the loss not only of forests but also of soil fertility. The indigenous Santhal tribes were forced to migrate seasonally. Many people lost their land – especially women, who had fewer traditional rights to land. The women began forming *samitis* or



Kabale Women's Agroforestry Project.

hilly, strip cropping and bund cultivation – all of which help to prevent the loss of soil through erosion. They also mulch their gardens to reduce loss of water.

- Sharing their concerns with the community and teaching them about environmental issues. They also give advice on environmental matters through workshops, seminars and conferences.

In this way these communities have tried their best to keep their environmental problems to an acceptable minimum. They are held back, however, by the economic status of the nation and the lack of organisation and properly trained technicians or environmentalists.

Beatrice Akoth

groups to protest at these Government policies. Eventually they received support from various groups and were given eroded and abandoned land. They began to reclaim the land by replanting it with local plants used by the tassar silk worm. They developed other interests, including producing cups and plates from sal tree leaves, making ropes from grass, cultivating fodder for dairy cows and planting tree nurseries to establish new forests.

One samiti group member stated...

'We have learned that actually it is the land that owns the people. We have worked hard to give the land a green cover, and in return it has clothed us with authority. We are advancing together. The journey has begun.'

Karlynn Eckman
from Forests, Trees and People Newsletter

The Amazon Conservation Awareness Program

THE CONTINUED DESTRUCTION of the Amazon rain forests is just one example of environmental destruction seen all around the world. The forest soils keep their fertility for many hundreds of years. However, when the forest cover is removed, the soils do not hold their fertility for more than two years. If managed in a sustainable way, the Amazon Basin could provide more animal protein than from all the land now used for beef production.

The Amazon Conservation Awareness Program was set up by YWAM (Youth with a Mission) in Brazil, to help conserve the natural resources of the Amazon. It provides an education for people of all ages in understanding and conserving these resources. It is hoped that a large area of land in Rondonia, Brazil, can be established as a natural reserve. The area lies next to two tribal lands and the surrounding

land is being claimed by settlers moving in from other areas. The reserve would therefore be very important as a 'buffer zone', standing between the traditional tribal way of life in the rain forest and the often destructive farming methods of the new settlers. It will protect the tribal people's way of life from the direct effects of the settlers' way of life. YWAM hope to use the area as an 'extractive reserve', where forest products such as timber, fruits, meat, firewood, oils, medicines and thatch, are harvested without damaging the forest.

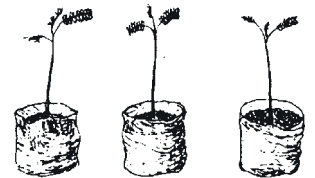
An education centre has been built in the area, providing courses for new settlers, tribal peoples, schoolchildren, students and tourists. The subjects taught include agriculture, agroforestry and small industries – all helping to increase understanding of the environment. Young people will

be trained as conservation patrol and advice officers.

YWAM hope the long term benefits will include...

- improved employment
- wise use of natural resources
- preserving the traditional cultural practices
- improved health and education
- growth of Christian groups and churches
- introduction of sustainable methods of agriculture
- a population which is environmentally aware.

Les Batty



Eldoret Rural Development Programme, Kenya

ALL OF US need to care for and protect our surroundings. According to God, the earth was created in such a way that mankind could get food without destroying the environment. We need to reflect on what has caused environmental problems in our areas and, if necessary, design new ways of farming and living which will help to restore our environment.

In our integrated rural development programme one of our priorities is the protection of the environment. We teach the subject of agroforestry at every meeting, lecture, discussion, workshop and seminar. During practical demonstrations we always make sure that a tree is planted to mark the occasion.

People need to be taught the importance of our environment. Involve the community from the beginning. Let them participate in sharing their concerns, planning and setting up environmental protection programmes. Avoid introducing ideas which threaten the source of food or money. Always try to introduce environmental protection that will eventually bring some kind of benefit

to those involved – for example: forest products or food.

Since we began introducing the idea of agroforestry in 1987 we have seen the environment here improve as people combine growing crops with growing trees. People say that their crop production has increased for various reasons – mulching (from the leaves of trees), wind breaks, control of soil erosion, recycling of nutrients, etc.

We should all protect our environment because none of us is likely to avoid the effects if we destroy it.

Ezekiel Sitienei



Photo: Mike Webb

Deforestation is a major environmental problem around the world.

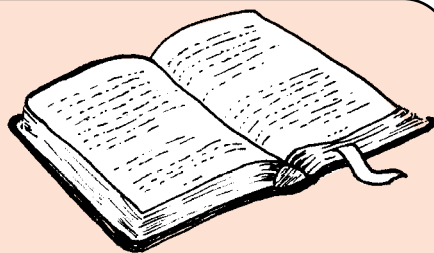
Umudike College of Agriculture, South Eastern Nigeria

THIS COLLEGE has set up an Environment Working Group of staff members. The group has set itself two main tasks...

- To review all the courses taught and to increase and improve the teaching on environmental issues.
- To examine all the activities at the college (on the farm, in the kitchens and hostels, in administration, in transport, etc) and to minimise their impact on the environment.

Caring for our environment

By Revd Tim Oakley



WHEN GOD created Adam and Eve, he put them into a garden, with the responsibility of looking after it. We may not all have gardens, but as the descendants of Adam and Eve, we all have a responsibility for the 'big garden' around us – the environment. Unfortunately, because of our sin, we are not very effective at caring for it. Only when God completely remakes the universe, will we and our environment be in perfect harmony. Meanwhile, the Bible gives us a few guidelines about living here today.

1. Read Leviticus 25:1–7

Is this a rule we must obey today (most of us are not Jewish), or does this simply give us good guidance to follow? Why did God tell them not to cultivate during every seventh year? I would suggest the following reasons...

Firstly, it was in honour of God, to remind people that it was God who provided them with land and crops. It was not just their own effort.

Secondly, perhaps because the people themselves benefited from a break in the annual cycle of hard work.

Thirdly, and also important (verse 7), it was for the good of the environment – for the plants, the soil, and the animals (and even insects)! Even today, land is often left fallow for a year, and benefits from this.

- How do we show that God has given us the land, rain, and crops?
- Do we enjoy a break from work, during which we can relax and thank God?
- Is it possible to overwork the land?

2. Read Leviticus 26:33–35

The people actually forgot the Sabbath rules. Because of this and other reasons, they were taken away from the land. See how God almost rejoices, not because the people have disobeyed him, but because at last, the land can enjoy the 'rest' from cultivation which it had deserved in God's honour.

We do not keep the same rules, but once we have worked out what is 'best' for the land, we must try to follow what

we have decided. Try not to be put off by difficulties!

3. Read Deuteronomy 20:19–20

In war, the rules of life change. People can forget to love in the same way. The environment suffers too. In those days, trees were cut down to use in attacking enemy cities. God could not stop that, as wars sometimes become unavoidable. Instead, he put a limit to the damage caused by war. So fruit trees were not to be cut down. Why? Because it was not in their future interests. No fruit trees means no fruit, less food and hungry people.

- Can we think of mistakes made in our local area, which have later meant less food (or worse health)?
- Do we plan what we plant or what we do to the environment, just for tomorrow; or for next year; or for twenty years time (when our children will be grown up)?

4. Read Matthew 10:29–31

Are small birds important to God? Yes! He feeds them, and he even 'clothes' the plants with beautiful flowers. (Matthew 6:25–30) But even more, he cares for people. We were created in his image. He can even check if one of our hairs has gone missing! So, while we should care for the environment (and birds and plants) because God cares, even more, we should care for people.

- Are there any changes in our local area which should be made, because they will clearly help the people who live there?
- If changes are made, will some people oppose it because the environment (trees, animals, rivers, etc) is more 'special' to them, than the humans who would benefit? How can we solve this problem, for the good of the community?

In the Bible, the whole creation is important, as well as the people. We are meant to work in harmony with the world God has made to support us. Take courage when you seek to protect the environment, and the people who live there! This difficult project is also on God's agenda. You can pray about its success.

A legend from India...

'The traveller begged for shade. The tree gave it. Then he begged for food; the tree gave it.

Then the traveller felt like staying with the tree and building his home near it. He looked for an axe to fell the tree. Then he begged for a handle for his axe from the tree. The tree gave it.

But when his house was built, the traveller cried and felt lonely and left.

What was a house without a tree?'

...and a poem from Sri Lanka

Sri Lanka of our forefathers was a rich land.

Rich in the abundance of life and plentiful in its gifts.

From forest-clad mountains and jungles full of bird and beast, to the splendid reefs that lined our shores.

Bringing everything in plenty to animal and man alike.

A land respected and cherished for thousands of years.

Till our fathers were taught to think otherwise.

The Sri Lanka we inherit is but a shadow of the treasure that was taken from us.

Yet all is not lost.

So we come together to take a last stand.

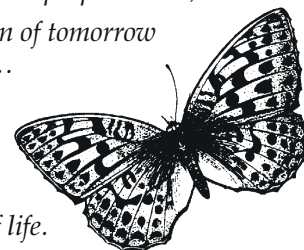
A last chance to make people realise,

To give the children of tomorrow a chance to know...

The flight of the butterfly

The song of birds

The rich variety of life.



NATCOG is a small nature conservation group formed in 1992 in Sri Lanka. They study the natural resources, looking out for any activities which may be harmful to the environment, and collect information for sharing with schools and interested groups.

NATCOG, 9 Balapokuna Place, Colombo 6, Sri Lanka

Turning the Tide

by Dr Marie-Thérèse Feuerstein

Save the Children 226 pages

ISBN 0-333-57421-4

Subtitled, *Safe Motherhood: A District Action Manual*, this book looks at what 'safe motherhood' means – the risks to women from pregnancy, childbirth, abortion – depending on their status and access to health care. It discusses in detail how to mobilise health services for safe motherhood at local and district level. Training for community involvement, partnership in health care, monitoring, record keeping and research are all covered in full. The book is designed for all who work in healthcare that involves women. It will also be useful to teachers, adult educators, agricultural and community development workers and all involved with women's development. It uses clear and straightforward language and is well illustrated.

The book is available from TALC at a cost of £7.50 including postage and packing. Two or more copies will cost £7.15 each. Order from...

TALC
PO Box 49
St Albans
Herts
AL1 4AX
UK.



Sustainable Agriculture

A catalogue containing a selection of useful books on the subject of sustainable agriculture for development which has been put together by Christian groups in Germany. Details of about 40 books and newsletters are included, together with information about ordering the books mentioned. Write to...

Bread for the World
Postfach 10 11 42
7000 Stuttgart 10
Germany.

Carta de Salud y Educación Popular

This is a regional newsletter, aimed at all health workers, describing local experience of popular education, health promotion and community involvement. It includes reports from

health projects and resources. It is available quarterly, free of charge, in Spanish to health workers in South America. Write to...

CEAAL
Viña del Mar 12
Casilla 296-22
Santiago
Chile.

Population, Development and the Media

Pakistan Press International

This special issue of the magazine *Economic Outlook* (40 pages) looks at a variety of issues concerning population, including reporting the issues, traditional family values and sustainable development. A single copy costs Pakistan Rupees 50.00, a year's subscription Rs 600.00.

Pakistan Press International
PO Box 541
Karachi
Pakistan.

Under the Bright Wings

by Peter Harris

Hodder & Stoughton Price £6.99
ISBN 030-580445

A paperback book that tells the story of the setting up of a Christian bird observatory and field study centre – A Rocha in Portugal. It provides a distinctly Christian basis for environmental conservation, showing how evangelism, conservation and research can be successfully combined.

NEWS

A Colombian Scientist, Manuel Patarroyo, is working on developing a new TB vaccine that may be able to protect adults. The present BCG vaccine gives good results for children but fails to provide protection for adults. He is carrying out trials with this new vaccine on mice and monkeys, with encouraging results. There is no news about when such trials could begin with people. He has also developed a new malaria vaccine, at present being tested in Tanzania.

From *New Scientist*, April 1994

Environment Information Centres

ZOPILOTE ASSOCIATION

This group runs two-week courses each year in sustainable development in the Mexico Highlands. A variety of topics are covered and the courses include practical work and field trips. Participants come from the USA and Latin America. Teaching is in English and Spanish. Fees vary depending on the background of the students. Some subsidised places are available. The courses have been running successfully for eight years.

Zopilote Association, Box 123, Cottage Grove, Oregon 97424, USA.

A ROCHA

This group will answer specific queries about nature conservation from a Christian basis. They are prepared to give advice to people interested in setting up their own similar projects in different parts of the world.

A Rocha, Cruzinha, Mexilhoeira Grande, 8500 Portimão, Portugal

THE PERMACULTURE ASSOCIATION OF ZIMBABWE

A variety of training courses in Permaculture and sustainable development in English and Shona, a regular newsletter for members and advice on Permaculture and organic gardening and agroforestry in Zimbabwe.

The Permaculture Association of Zimbabwe, Famidzanai Training Centre, PO Box 8515, Causeway, Zimbabwe.

ENVIRONMENT AND RESOURCE STEWARDSHIP

A three week seminar and a five month course run by YWAM in Rondonia, Brazil (see page 11) for Christian leaders and workers who want to learn more about the importance of environmental stewardship in community development situations.

YWAM, Caixa Postal 441, Porto Velho, Rondonia, 78900-970, Brazil

TRINITY ENVIRONMENTAL SERVICES

This group, run by Leslie Batty, may be able to help with: Environmental Impact Assessment studies; situation analysis to identify key issues and strategies; special area management planning; environmental education and training.

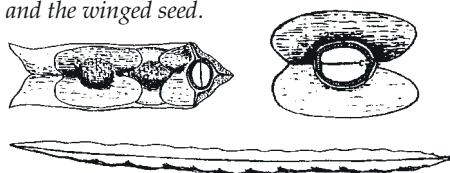
Trinity Environmental Services, 32 Becksides, Beverley, Humberside, HU17 0PD, UK

Tel: 0482 871140



Green pods on a 12 month old moringa tree.

(Below) The long pod, an opened portion (left) and the winged seed.



Moringa oleifera

A MULTIPURPOSE TREE

by Geoff Folkard and John Sutherland

RIVER WATER taken for household use can be full of suspended matter, particularly in the rainy season. The water carries silt particles, solids, bacteria and other micro-organisms (some of which can carry disease). It is very important to remove as much as possible of this material before people use the water. Large water treatment centres do this by adding chemical coagulants to the water. These cause the particles to stick together (coagulate) and sink. The clean water can then be poured off. The correct chemicals, however, may be unavailable or too expensive. An alternative is to use a natural coagulant, usually made from plants. In certain parts of the world, this has been done for centuries on a small scale.

The Environmental Engineering Group at Leicester University, UK, has been studying the potential use of natural coagulants on a large scale in water treatment works. Their work has looked at the natural coagulation properties of crushed seed of the *Moringa oleifera* tree. This is a native of northern India which is now grown widely through the tropics. It is sometimes known as 'drumstick' (because of the shape of its pods) and 'horseradish' (describing the taste of its roots). Moringa grows rapidly from seed or cuttings, even in poor soils. It needs little care and can survive long periods of drought. It grows rapidly – growth of up to 4 metres in height, flowering and fruiting were all observed within one year of planting during trials near Nsanje, Southern Malawi. In some areas of Southern India, two harvests of seed pods are possible in a single year. As the table shows, the tree has many uses.

mortar. The amount of seed needed to treat river water depends on how much suspended matter the water contains. Users quickly become familiar with the changing needs of their particular water as the quantity of sediment changes with the seasons.

To treat 20 litres of water (the amount carried in the average large bucket) about 2 grams of crushed seed is needed (2 level 5ml teaspoons or 2 rounded soda bottle tops). Add a small amount of clean water to the crushed seed to form a paste. Put the paste into a clean



Untreated river water (left) after 2 hours settlement. On the right is water treated with moringa seed solution and left to settle for 30 minutes.

THE USES OF MORINGA

VEGETABLE

- Green pods, leaves, flowers and roasted seeds.

OIL

- Seeds contain 40% of oil by weight.
- Used for cooking, soap manufacture, cosmetic base and in lamps.

WATER COAGULANT

- Traditionally used for 'household treatment' in the Sudan and Indonesia.
- Successfully used in large scale water treatment works in Malawi.

OTHER USES

- All parts of the plant are used in a variety of traditional medicines.
- Powdered seed is used in ointment to treat common bacterial skin infections.
- Leaves and seed presscake are useful as cattle fodder and soil fertiliser.
- Grown as live fences and windbreaks.
- Fuelwood source after coppicing (cutting back the main stem to encourage side shoots).
- Agroforestry; for intercropping with other crops – the trees are legumes and add nitrogen to the soil.

Household water treatment

Seed pods should be left to mature on the tree and harvested when dry. The light 'wings' and shells of the seeds are easily removed, leaving the white seed kernels. These are finely crushed and pounded, using a pestle and

bottle – a soda bottle is ideal. Add a cup (200ml) of clean water and shake for 5 minutes. This action activates the chemicals in the crushed seed.

Filter this solution through white cotton cloth into a 20 litre bucket of river water. The contents are stirred rapidly for 2 minutes, followed by slow stirring for 10–15 minutes. During this slow mixing period, the moringa seed binds together (coagulates) the fine particles and bacteria into larger particles which sink and settle at the bottom of the bucket. After an hour, clear water can be drawn off.

This process will remove 90–99.9% of the bacteria which are attached to the solid particles, as well as clearing the water. However, some harmful micro-organisms still in the water may not be removed, especially if the water is very badly polluted. For drinking water, further purification is recommended – either by boiling or with a simple sand filter. The dried seeds (remove discoloured ones) and powder can be stored. However, the paste must be prepared fresh each day.

Large scale water treatment

Our experimental work was carried out at Thyolo in Southern Malawi where a water treatment works was built as a model system for village water treatment. Electrical power is not required for operation. In Malawi in 1993, imported chemicals from South Africa cost the Water Utilities over £400,000 in valuable foreign exchange. Our trials using moringa seed gave water purification results which were just as good as those obtained with commercial chemicals – at a fraction of the cost. 50–150mg of ground seed is needed for 1 litre of water. Simple jar tests will determine how much seed is needed.

Many developing countries could save huge amounts of money by adopting these ideas.

Moringa as a vegetable and oil source

Moringa pods are an important commercial vegetable crop throughout India. In the south many varieties have

been developed with a range of pod lengths, and growing periods. They are sold fresh in local markets. Immature green pods are cut into sections and canned in brine for export to Europe and America.

Elsewhere in the world moringa trees are prized by villagers for their pods and leaves. The leaves have a high protein content of 27% and are rich in vitamins A and C, calcium, iron and phosphorus. A particular advantage is that moringa leaves can be harvested during the dry season when no other fresh vegetables are available.

Moringa seed contains 40% by weight of oil. Laboratory tests at Leicester confirmed that the presscake remaining after oil extraction still contains the active coagulants. It can be used to treat water in just the same way as already described. Presscake can also be dried and stored. It may be obtained without cost as a by-product of oil extraction.

This is a very important point. Moringa seeds can be used first for oil extraction, without reducing their effectiveness for water treatment. Moringa oil is of high quality and potentially has a high market value. The oil is of equal value both for cooking oil and as the main ingredient for soap manufacture. The demand for oil in Malawi is far greater than present production within the country. Soya bean oil is therefore imported from South America.



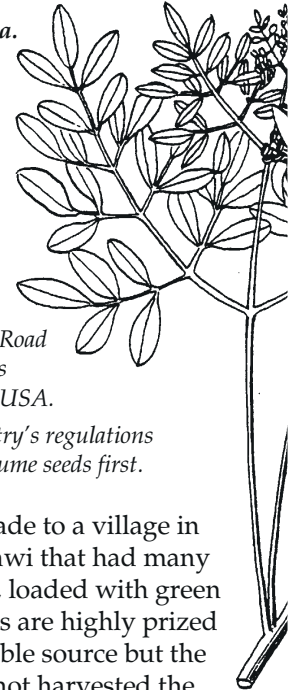
Winged seeds of *moringa oleifera* (right), when crushed, give oil and (front) the presscake that can be used for water treatment and animal feed.

Moringa oleifera.

If readers have difficulty in locating local specimens, small sample packets of seeds may be obtained from...

ECHO
17430 Durrance Road
North Fort Myers
FL, 33917-2200, USA.

Check your country's regulations for importing legume seeds first.



A visit was made to a village in southern Malawi that had many moringa trees, loaded with green pods. The trees are highly prized for this vegetable source but the villagers had not harvested the pods as they could not afford the imported vegetable oil necessary to cook them and they did not realise the moringa was itself a source of oil.

Conclusions

The planting of moringa trees by smallholder farmers should be encouraged. It will improve both their health and income. This valuable tree will provide both fresh vegetables and raw materials for oil extraction. Simple technology is available to encourage small scale oil milling enterprises to be established in the rural areas. Tests are being carried out by ITDG Zimbabwe.

The great potential of the tree and its various products has not been recognised. In southern Nigeria, the moringa tree is known as *idagba manoye* – which translates as 'growing up without sense'. One can hope that in the future, good sense prevails and the true potential of this tree and its many products is realised.

Geoff Folkard and John Sutherland are members of the Environmental Engineering Group at the University of Leicester. They invite correspondence from readers on the cultivation of the many varieties of *moringa oleifera* and from those with experience of moringa oil extraction and use. They may be contacted at...

Department of Engineering
University of Leicester
Leicester, LE1 7RH, UK.

Wildlife Management

A CASE STUDY FROM ZAMBIA

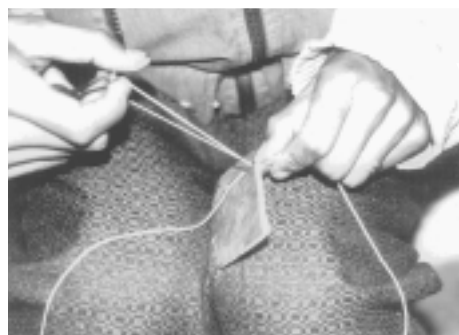
AFTER MANY YEARS of trying, through a very expensive law enforcement campaign, to deal with the poaching of wildlife, Zambia realised that no progress was being made. Poaching continued at the same rate – in some areas it even increased.

This situation led Zambia's National Parks and Wildlife Service to carry out studies to find out the real causes of poaching. They discovered **four important issues** which influence the level of poaching. These issues may be of great interest to other groups working with conservation of wildlife and nature reserves.

1. Supplies of food

In villages with good supplies of food – particularly meat and fish – there are fewer traditional hunters and less poaching.

- Encourage the production of alternative sources of protein – for example: beans, groundnuts or fish farming. Village hunters could be allowed a sustainable quota of certain animals to hunt each year – on condition that this meat is then available for the community. In this way, endangered species will be protected.



Encourage small income-generation projects, using sustainable wildlife products, eg: leather.



Photo: Richard Hanson

2. Employment

There is a growing need for employment in rural areas. If there is no employment, villagers desperate for money will become involved in the sale of meat and other livestock products – whether or not this is legal. People's needs for money must be seen as genuine and respected.

- Local residents should be trained and employed in the management of wildlife. These trained, local village scouts have more knowledge, are more dedicated and cheaper than government civil servants. This results in an increased understanding and appreciation of wildlife resources.
- Encourage small income generation projects which depend on the use of sustainable wildlife products. As residents grow to depend on these, their support for the conservation of the resources will increase.
- Encourage village meetings where local villagers can share their views on the management of wildlife resources.

3. Traditional leadership

Traditionally the chiefs and headmen have made decisions about land use and ownership. The loss of these responsibilities to the government has led to poor protection of wildlife.

- Encourage partnership between traditional local leadership and government officials to deal with wildlife conservation issues. Village chiefs should have their respect and authority in these matters restored. They can then deal effectively with

problems and receive greater respect from their people.

4. Increased earnings

The area must be able to make a good income from the local management of wildlife resources. Income should be used to increase local employment, develop alternative food supplies and encourage the local management of wildlife resources.

Time will be needed for these changes to take place. Local people may at first be unhappy to cooperate because of earlier harsh treatment from wildlife and government officials. Patience and persistence will be needed to build up relationships. The benefits of these ideas must reach most residents. Otherwise, villagers who feel they have 'missed out' may cause problems.

Once success has been achieved, good news spreads fast. This certainly happened in Zambia. Once some programmes were successful, other communities wanted to join in.

Adapted from an article in Forest, Trees and People, Newsletter No 13, based on a report by D M Lewis, A Mwenya and G B Kawache: African Solutions to Wildlife Problems in Africa.

Published by



CHRISTIAN CONCERN IN A WORLD OF NEED

100 Church Road, Teddington, TW11 8QE, UK

Editor: Isabel Carter, 83 Market Place, South Cave, Brough, N Humberside, HU15 2AS, UK